

Memo To: Faculty Senate
From: Missouri S&T Campus Curriculum Committee Meeting
RE: December 8, 2010 and January 5, 2011 meetings

The Missouri S&T Campus Curricula Committee recommends to the Faculty Senate that the curriculum changes and degree proposals on the following DC forms be approved.

Approved DC forms:

DC 0367, Geology/Geophysics, Master of Science, approved effective Fall 2011.

The Geology/Geophysics Master of Science degree would like to add the option for a Master of Science degree with a non-thesis option.

DC 0373, Explosives Engineering, Master of Science, approved effective Fall 2011. A proposal to create a Master of Science with a non-thesis option.

DC 0374, Chemistry Bachelor of Science, Pre-medicine Emphasis Area, effective Fall 2011. A proposal to correct the current curriculum by changing Bio Sci 211 to 3 credit hours and adding Bio Sci 212, 1 credit hour.

DC 0375, Chemistry Bachelor of Science, Biochemistry Emphasis Area, effective Fall 2011. A proposal to correct the current curriculum by changing Bio Sci 211 to 3 credit hours and adding Bio 212, 1 credit hour, and modifying the elective footnotes.

DC 0376, History and Political Science, Political Science Minor, effective Fall 2011. A proposal to modify the current curriculum for the political science minor. No longer requiring Political Science 235 and changing from 9 credit hours of 200 and 300 level courses to 12 credit hours to maintain the same total number of credit hours.

The Missouri S&T Campus Curricula Committee recommends to the Faculty Senate that the course changes on the following CC forms be approved.

Approved CC forms:

CC 8004, Aerospace Engineering 319, Mechanical Engineering 319, Advanced Thermodynamics. The following change is approved effective Fall 2011.

Prerequisites – Present: AE 233

Proposed: ME 219

CC 8031, Geology 434, Granite and Rhyolite Petrogenesis. New course approved effective Fall 2011.

Catalog Description: The origin of granites and rhyolites with respect to extreme fractionation, crustal anatexis, magma mixing, and tectonic setting will be explored through critical reading of the literature and examination of hand samples and thin sections from classic geologic terranes. A research paper is required as well as a field trip at the student's expense.

Credit Hours: 3 hr. lecture, 1 hr. lab

Prerequisites: Geology 130

CC 8032, Geology 420, Analytical Structural Geology. New course approved effective Summer 2011.

Catalog Description: The course provides theoretical background, analytical techniques, and hands-on experience, for quantifying processes that lead to the formation and evolution of rocks and structures produced as a result of deformation at a variety of scales – hand sample to global. Poster- and oral- presentations, and a research paper required.

Credit Hours: 2 hr. lecture, 1 hr. lab

Prerequisites: Geology 220, Geophysics 381

CC 8033, Geology 320, Advanced Structural Geology. New course approved effective Summer 2011.

Catalog Description: The course provides theoretical background, analytical techniques, and hands-on experience for analyzing geologic structures at a variety of scales- hand sample to global.

Credit Hours: 2 hr. lecture, 1 hr. lab

Prerequisites: Geology 220, Geophysics 381

CC 8070, Mechanical Engineering 312, Aerospace Engineering 352, Introduction to Finite Element Analysis. The following change is approved effective Fall 2011.

Prerequisites – Present: Math 204

Proposed: Mc Eng 208 or Aero Eng 253 or consent of instructor for majors that do not require either of these courses.

CC 8071, Metallurgical Engineering 318, Principles for Microstructural Design. New course approved effective Spring 2012.

Catalog Description: This course will introduce the basics of microstructural principles that can be used to design advanced materials. It will help students learn about the basic principles and microstructural design approaches.

Credit Hours: 2 hour lecture

Prerequisites: At least junior standing, Met 215; Met 217 or equivalent.

CC 8073, Ceramic Engineering 222, Applied Glass Forming. New course approved effective Fall 2011.

Catalog Description: Examines the properties and behavior of molten glass along with basic forming techniques, including off-hand shaping, molding and casting.

Credit Hours: 1 hour lecture, 1 hour lab

Prerequisites: Cer 104 or Met 125; freshmen, sophomore, or junior only or by instructor permission.

CC 8080, Mechanical Engineering 330, Aerospace Engineering 330, Applied Computational Methods. New course approved effective Fall 2011.

Catalog Description: Detailed study of computational methods for efficient solution of selected fluids, structures, thermodynamics, and controls problems in aerospace and mechanical engineering. Besides basic numerical techniques, topics covered include gradient-based optimization and uncertainty quantification.

Credit Hours: 3 hour lecture

Prerequisites: Cmp Sc 53 or 73 or 78; Math 204

CC 8082, Business 490, Research. The following change is approved effective Fall 2011.

Catalog Description – Proposed: Research investigation of an advanced nature leading to a major report suitable for publication in a journal or in a conference proceedings.

Credit Hours – Present: 0-6 hr. lecture

Proposed: 0-9 hr. lecture

Prerequisites – Present: Bus 420

Proposed: Permission of the instructor

CC 8083, Marketing 490, Research. The following change is approved effective Fall 2011.

Catalog Description – Proposed: Research investigation of an advanced nature leading to a major report suitable for publication in a journal or in a conference proceedings.

Credit Hours: Present: 0-15 hr. lecture

Proposed: 0-9 hr. lecture

CC 8084, Business 496, Project Research. New course approved effective Fall 2011.

Catalog Description: The research project will involve students applying research techniques and discipline specific knowledge working on a project designed by the advisor, often working with a business organization. Requires major report and formal presentation to sponsoring organization.

Credit Hours: 0-9 hour lecture

Prerequisites: Permission of the instructor

CC 8085, Mechanical Engineering 423, Aerospace Engineering 423, Viscous Fluid Flow. The following changes are approved effective Fall 2011.

Catalog Description – Proposed: Fundamentals of viscous fluids for incompressible and compressible flows governed by Navier-Stokes equations; exact, approximate, and numerical solutions for steady and unsteady laminar flows; boundary layer theory for incompressible and compressible flows; stability and transition.

Prerequisites – Present: ME or AE 331

Proposed: ME 331 or AE 331 or ME 339 or AE 339 or equivalent

CC 8086, Mechanical Engineering 435, Aerospace Engineering 435, Turbulence in Fluid Flow. The following changes are approved effective Fall 2011.

Course Title – Proposed: Turbulent Flows – Theory, Measurements & Modeling

Catalog Descriptions – Proposed: Navier-Stokes equations; statistical description and mean-flow equations; behavior of free shear and wall bounded flows; the energy cascade; turbulence spectra and Kolmogorov hypothesis; measurement techniques: PIV, hot-wires, LDV; turbulence modeling for transport processes and closure schemes for RANS equations; evaluation of model constants, introduction to LES, DNS and hybrid-RANS.

Prerequisites – Present: ME 331 or AE 331

Proposed: ME 331 or AE 331 or ME 339 or AE 339 or equivalent

CC 8087, Mechanical Engineering 220, Engineering Design Methodology. The following changes are approved effective Fall 2011.

Course Number – Proposed: ME 361

Prerequisites – Present: Junior standing in engineering and at least 12 hours major field credit

Proposed: At least Senior standing in engineering

CC 8090, Mining Engineering 270, Mining Industry Economics. The following change is approved effective Fall 2011.

Prerequisites – Present: None

Proposed: Econ 121 or 122

CC 8091, Technical Communication 331, Technical Editing. The following change is approved effective Fall 2011.

Prerequisites – Present: Tch Com 65 and Tch Com 240

Proposed: Tch Com 65 or English 65 or equivalent

CC 8092, Technical Communication 361, History of Technical Communication. The following change is approved effective Fall 2011.

Prerequisites – Present: Tch Com 65 and Tch Com 240

Proposed: Tch Com 65 or English 65 or equivalent

CC 8093, Computer Science 253, Algorithms. The following change is approved effective Fall 2011.

Prerequisites – Present: Cmp Sci 128 and Cmp Sci 153

Proposed: Cmp Sci 128, Cmp Sc 153, preceded or accompanied by Calculus I

CC 8094, Business 350, Customer Focus and Satisfaction. New course approved effective Fall 2011.

Catalog Description: Major emphasis is given to the concept of customer focus, with coverage of techniques for obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and maximizing the benefits of customer feedback. A semester long HoQ project will be done.

Credit Hours: 3 hr. lecture

Prerequisites: Mkt 310 or Mkt 307 or Eng Mgt 251

Co-listing: Mkt 350

CC 8095, Marketing 350, New Product Development. The following changes are approved effective Fall 2011.

Course Title – Proposed: Customer Focus and Satisfaction

Catalog Description: Major emphasis is given to the concept of customer focus, with coverage of techniques for obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and maximizing the benefits of customer feedback. A semester long HoQ project will be done

Co-listing: Bus 350

CC 8096, Marketing 450, Advanced New Product Development. The following changes are approved effective Fall 2011.

Course Title – Proposed: Advanced Customer Focus and Satisfaction

Catalog Description – Proposed: Major emphasis is given to the concept of customer focus, with coverage of techniques for obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and maximizing the benefits of customer feedback. Individual focused research is included.

Co-listing: Bus 450

CC 8097, Business 450, Advanced Customer Focus and Satisfaction. New course approved effective Fall 2011.

Catalog Description: Major emphasis is given to the concept of customer focus, with coverage of techniques for obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and maximizing the benefits of customer feedback. Individual focused research is included.

Credit Hours: 3 hr. lecture

Prerequisites: Mkt 311 or Mkt 307 or Eng Mgt 251

Co-listing: Marketing 450

CC 8098, Computer Science 206, Software Engineering I. The following change is approved effective Fall 2011.

Prerequisite – Present: Cmp Sci 253

Proposed: Cmp Sci 253 and at least junior standing

CC 8100, Political Science 317, Program Analysis and Evaluation. The following change is approved effective Fall 2011.

Course Title – Proposed: Public Policy Analysis

CC 8101, Computer Science 302, Agile Software Development. New course approved effective Fall 2011.

Catalog Description: Understand principles of agile software development and contrast them with prescriptive processes. Specifically: Eliciting, organizing, and prioritizing requirements; Design processes; Understand how a particular process promotes quality; Estimate costs and measure project progress and productivity.

Credit Hours: 3 hour lecture

Prerequisites: Cmp Sc 206

CC 8104, Chemistry 361, General Biochemistry. The following change is approved effective Fall 2011.

Prerequisites – Present: Chem 223 and Bio 211

Proposed: Chem 223

For the information of the Faculty Senate, the following EC forms have been submitted by the University departments for an experimental course that will be offered in the near future.

Approved EC forms:

EC 2293, Geological Engineering 401, Surface Waves (MASW) & Ground Penetrating Radar (GPR), approved effective Spring 2011.

Course Description: Basic theory and the acquisition, processing and interpretation of surface waves (MASW and ReMi) and ground penetrating radar (GPR) data are covered. Emphasis is placed on geotechnical and structural applications of these non-invasive imaging technologies. Numerous case studies are presented in order to illustrate the utility of these geophysical tools.

Credit Hours: 2 hr. lecture, 1 hr. lab

Prerequisites: GE 50 or CE 215 or equivalent; graduate standing

EC 2294, Explosives Engineering 401, Regulatory Issues in the Explosives Industry, approved effective Summer 2011.

Course Description: A comprehensive coverage of the regulations governing the explosives industry, including those of the Bureau of Alcohol, Tobacco Firearms and Explosives (ATF), the Department of Transportation (DOT), the Environmental Protection Agency (EPA) and other federal agencies.

Credit Hours: 3 hr. lecture

Prerequisites: None

EC 2295, Mechanical Engineering 301, Fuel Cell Principles, approved effective Spring 2011.

Course Description: Fuel cell fundamentals including thermodynamics, reaction kinetics, mass transport, characterization, and modeling are discussed. Different types of fuel cells such as proton exchange membrane and solid oxide are covered together with subsystem design and system integration as well as environmental impacts.

Credit Hours: 3 hr. lecture

Prerequisites ME 221

EC 2297, Economics 301, Economic Analysis of Natural Resources of South Africa, approved effective Spring 2011.

Course Description: Economic analysis of the utilization of natural resources of South Africa with an emphasis on strategic minerals, solid earth energy resources, bling minerals (diamond, gold), and endangered species. Students will utilize technology to complete joint projects with students from the University of the Western Cape, South Africa.

Credit Hours: 1 hr. lecture

Prerequisites: Preceded or accompanied by Geology 301 – Geological Analysis of Natural Resources of South Africa

EC 2298, Economics 301, Field Investigation of the Economics of Natural Resources of South Africa, approved effective Spring 2011.

Course Description: A three week field study in south Africa examining the economic utilization of the natural resources of the country including site visits to mines (diamond, gold), geological sites (Cape of Good Hope), big game animal parks, and areas of cultural interest associated with utilization of these resources. Field trip required.

Credit Hours: 2 hr. lecture

Prerequisites: Geology 301 – Geological analysis of Natural Resources of South Africa, Preceded or accompanied by Geology 301 – Geological Field Investigation of Natural Resources of South Africa

EC 2299, Geology 301, Geological Field Investigation of Natural Resources of South Africa, approved effective Spring 2011.

Course Description: A three week field study in South Africa of the geology of the natural resources of the country including site visits to mines (diamond, gold), geological sites (Cape of Good Hope), and areas of cultural interest associated with utilization of these resources. Field trip required.

Credit Hours: 2 hr. lecture

Prerequisites: Geology 301 – Geological Analysis of Natural Resources of South Africa, Econ 301 – Economic Analysis of Natural Resources of South Africa, and preceded or accompanied by Econ 301 – Field Investigation of the Economics of Natural Resources of South Africa

EC 2300, Geology 301, Geological Analysis of Natural Resources of South Africa, approved effective Spring 2011.

Course Description: Geological analysis of natural resources of South Africa with an emphasis on strategic minerals (platinum), solid earth energy resources (coal, tight gas shales), industrial minerals (iron, lead), and bling minerals (diamonds, gold). Students will utilize technology to complete joint projects with students from the University of the Western Cape, South Africa.

Credit Hours: 1 hr. lecture

Prerequisites: Preceded or accompanied by Econ 301 – Economic Analysis of Natural Resources of South Africa

EC 2301, ERP 301, Enterprise Resource Planning systems in Small and Medium Size Enterprise, approved effective Fall 2011.

Course Description: The course provides an overview of enterprise applications for small and midsize companies. SAP Business One is introduced to illustrate the enterprise-wide application for entrepreneurs, who manage business functions across sales, operation, and financials, all in a single integrated system. Enterprise integration will be examined and examples developed.

Credit Hours: 3 hr. lecture

Prerequisites: ERP 346; or both Bus 120 and ERP 246

EC 2302, Mechanical Engineering 401, Advanced Digital Design and Manufacturing, approved effective Spring 2011.

Course Description: This course covers selective topics essential to advanced digital design and manufacturing. These topics include freeform modeling, reverse engineering, NC path generation, and immersive digital design and manufacturing. Students will learn theoretical and practical materials on the various topics from the lectures as well as from project exercises.

Credit Hours: 3 hr. lecture

Prerequisites: ME 308 or ME 363

EC 2303, Civil Engineering 301, Environmental Engineering 301, Phytoremediation and Natural Treatment Systems: Science and Design, approved effective Spring 2011.

Course Description: Students learn the scientific basics of chemical transport in soil and ground water and learn the fundamental plants physiology and processes. Students then learn how these processes are utilized in design of phytoremediation and natural treatment systems, including the most up to date literature and design guidance available.

Credit Hours: 3 hr. lecture

Prerequisites: CE 265 or Env Eng 265 or Graduate Standing

EC 2304, MSE 401, Advanced Principles of Microstructural Design, approved effective Spring 2011.

Course Description: This course will introduce the microstructural principles that can be used to design advanced materials. It will help students learn about the principles and microstructural design approaches. In addition, they will design a theoretical microstructure for high efficiency structure.

Credit Hours 3 hr. lecture

Prerequisites: None

EC 2305, Geology 401, Advanced Depositional Systems, approved effective Spring 2011.

Course Description: Development of three dimensional depositional models using Walther's Law, Walther's Warning and seismic stratigraphy. Emphasis on overall geometries and internal porosity and permeability characteristics of aquifers and hydrocarbon reservoirs. Literature research, class project, and class presentation are required.

Credit Hours: 3 hr. lecture

Prerequisites: Geo 223

EC 2306, Geology 401, Stratigraphy and Basin Evolution, approved effective Spring 2011.

Course Description: Advanced topics in sedimentary geology and time-stratigraphy, especially sequence stratigraphy. Concepts, models, and critical thinking in sequence stratigraphic analysis of basin fills by integrating microscopic, outcrop, well and seismic data and observations. Applications in basin analysis and microscopic, outcrop, well, and seismic data and observations. Applications in basin analysis and groundwater and petroleum exploration. Class project and presentations are required.

Credit Hours: 3 hr. lecture

Prerequisites: Geo 223, Geo 220

EC 2307, Ceramic Engineering 301, Advanced Materials and Processes for Electrochemical Devices, approved effective Spring 2011.

Course Description: This course will provide an overview of materials aspects of advanced batteries and battery systems, focusing on electrode materials, separators and electrolytes. Current materials challenges that must be met to further improve battery performance will be discussed. A research topic on advanced battery materials (term paper) is required.

Credit Hours: 3 hour lecture, 1 hour lab

Prerequisites: Graduate standing in a science or engineering discipline.

EC 2308, Ceramic Engineering 201, Materials and Processes for Electrochemical Devices, approved effective Spring 2011.

Course Description: This course will provide an overview of materials aspects of advanced batteries and battery systems, focusing on electrode materials, separators and electrolytes. Current materials challenges that must be met to further improve battery performance will be discussed.

Credit Hours: 3 hour lecture, 1 hour lab

Prerequisites: At least junior level standing in a science or engineering discipline.

EC 2309, Computer Science 401, Cloud Computing, approved effective Fall 2011.

Course Description: Cloud computing architecture, data management and indexing in cloud computing, security and privacy issues in cloud computing, scheduling and cost analysis, sensor and mobile cloud, Ajax/mapreduce and EC3 cloud.

Credit Hours: 3 hour lecture

Prerequisites: Instructor's permission and knowledge of operating systems, databases, distributed computing, and a programming language.

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Missouri S&T Campus Curricula Committee